

Amendment  
Serial No. 10/781,006

Docket 5000-1-506

**IN THE CLAIMS:**

*Please amend the claims as follows:*

1. (Currently Amended) A wavelength-division-multiplexed passive optical network comprising:

a central office in which a multi-wavelength lasing source is located, said multi-wavelength lasing source having a multiplexing/demultiplexing unit and a plurality of reflectors comprised of mirrors coupled to the multiplexing/demultiplexing unit to reflect demultiplexed signals back to the multiplexing/demultiplexing unit;

a plurality of subscriber terminals for transmitting an upward signal using a reflected signal of a multi-wavelength signal transmitted from the central office; and

a local office disposed between the central office and the subscriber terminals via optical fibers for demultiplexing the multi-wavelength signal transmitted from the central office and for multiplexing signals from each of the subscriber terminals.

2. (Currently Amended) A wavelength-division-multiplexed passive optical network as claimed in claim 1, wherein the central office comprises:

a first optical amplifier for generating amplified spontaneous emission noise;

the multiplexing/demultiplexing unit having a first input/output terminal and a plurality of upward signal output terminals at a first side portion so as to receive the amplified spontaneous emission noise and to output a multi-wavelength lasing light, and a plurality of second input/output terminals and an upward signal input terminal for a multi-wavelength lasing light generation at the first side portion so as to output a multi-wavelength lasing light multiplexed in response to the input of the amplified spontaneous

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emission noise and to demultiplex and to output the upward signal in response to the input of the upward signal;

a plurality of upward signal receivers coupled to the upward signal output terminals at the first side portion of the multiplexing/demultiplexing ~~device-unit~~ in one-to-one correspondence;

the plurality of reflectors is coupled in one-to-one correspondence to the second input/output terminals at the second side portion of the multiplexing/demultiplexing unit, ~~so as to input~~ for reflecting said demultiplexed signals outputted through the second input/output terminals back to the second input/output terminals; and

a circulator for outputting a multi-wavelength lasing light inputted from the multiplexing/demultiplexing device to the local office and transmitting an upward signal inputted from the local office to the upward signal input terminal of the multiplexing/demultiplexing unit.

3. (Previously presented) A wavelength-division-multiplexed passive optical network as claimed in claim 2, wherein the multiplexing/demultiplexing unit is an  $N \times N$  waveguide grating router.

4. (Cancelled).

5. (Previously presented) A wavelength-division-multiplexed passive optical network as claimed in claim 2, wherein the central office further comprises an external modulator for modulating a multi-wavelength lasing light outputted from the

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multiplexing/demultiplexing unit on the basis of predetermined broadcasting service signals and for outputting the modulated signal to the circulator.

6. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 5, wherein the external modulator is a LiNbO<sub>3</sub> modulator.

7. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 5, wherein the external modulator is an electro-absorption modulator.

8. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 5, wherein the external modulator is a semiconductor optical amplifier.

9. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 1, wherein the subscriber terminal includes a reflective optical amplification means.

10. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 9, wherein the reflective optical amplification means is a reflective semiconductor optical amplifier.

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11. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 10, wherein the reflective semiconductor optical amplifier comprises an anti-reflection coating face formed on one side, a high-reflection coating face formed on another side, and a gain medium formed between the anti-reflection coating face and the high-reflection coating face, so that the semiconductor optical amplifier total-reflects a signal inputted through the anti-reflection coating face by the high-reflection coating face and outputs the total-reflected signal.

12. (Previously presented) A wavelength-division-multiplexed passive optical network as claimed in claim 11, wherein the semiconductor optical amplifier further amplifies and modulates the signal when the signal passes the gain medium.

13. (Original) A wavelength-division-multiplexed passive optical network as claimed in claim 9, wherein the subscriber terminal further comprises an optical distributor and a broadcasting data optical receiver so as to receive a broadcasting service signal, the optical distributor distributing downward signals inputted from the local office to the reflective optical amplification means and the broadcasting data optical receiver.

14. (Currently Amended) A wavelength-division-multiplexed passive optical network as claimed in claim 1, wherein the lasing source comprises:

- a laser diode;
- a circulator;
- a first and second optical distributor;
- a first optical amplifier coupled to the circulator and first and second optical distributor;

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~~a multiplexer/demultiplexer device~~ said multiplexing/demultiplexing unit  
coupled to the circulator;

~~a plurality of mirrors coupled to the multiplexer/demultiplexer device;~~ and  
a filter coupled to the circulator and a second optical amplifier.

15. (Currently Amended) A wavelength-division-multiplexed passive optical network as claimed in claim 14, wherein the lasing source further comprises an upward data receiver coupled to the ~~multiplexer/demultiplexer device~~ said multiplexing/demultiplexing unit.

16. (Currently Amended) A wavelength-division-multiplexed passive optical network as claimed in claim 14, wherein the lasing source further comprises a second circulator coupled to ~~plurality of mirrors~~ said multiplexing/demultiplexing unit, the second optical distributor and the local office.

17. (Previously Presented) A wavelength-division-multiplexed passive optical network as claimed in claim 16, wherein an external modulator is coupled between the second circulator and the second optical distributor.

18. (Previously Presented) A wavelength-division-multiplexed passive optical network as claimed in claim 9, wherein the subscriber terminal further comprises:

a broadcast reception optical receiver; and

an optical distributor coupled to the a reflective optical amplification means, the broadcast reception optical receiver and the local office.